Energy Supply Issues

Introduction

The Energy Supply sector evaluated policy options that would reduce GHG emissions from the generation and transmission of electricity, and the extraction and transmission of oil and gas. The policy options were ranked first by priority and second by bin classification. Priority was assigned after consideration of the amount of CO2 reduction potential, the criticality of the option to enable the related reduction pathway, the apparent cost/benefit, and the implementation time horizon (long term verses short term). The bin ranking was assigned after consideration of cost (dollar amount, effort and benefits), and political and technical feasibility. The two policy strategies that have the largest potential to reduce GHG are encouragement of renewable energy resources and development of Carbon Capture and Sequestration (CCS) technologies.

Members of the Energy Supply sector group who participated in meetings and conference calls to assess these options included: Ernie Wessman and Tim Wagner as co-chairs, Ted Rampton, Jeff Quick, Mike Golas, John Baza, Steven Aderholt, Sarah Wright, Sara Baldwin, Kyle Davis, Ron Daniels, Colleen Collis, Kathy Vandame, Paul Dremann, Cheryl Murray and Renee Zollinger.

ES-A - Develop Significant Amount of Renewable Energy Resources

Examples of renewable energy resources include wind, geothermal, solar PV, concentrating solar, biomass, and some hydroelectric facilities.

Benefit/Cost of Reducing CO_2e:

AZ: 116 MMt between 2007-2020; 10.2% of 2020 emissions; $6/ton
NM: 26 MMt between 2007-2020; 5.2% of 2020 emissions; $8/ton
MT: 16.9 MMt between 2007-2020; 5.6% of 2020 emissions; $3/ton

ES-1 Renewable Portfolio Standard

Assessment: High Priority. Bin B.
A renewable portfolio standard (RPS) is a requirement that utilities must supply a certain, fixed percentage of electricity from an eligible renewable energy source. Currently 23 states and Washington D.C. have adopted Renewable Portfolio Standards, with Illinois considering RPS legislation in their current legislative sessions. Some states have expanded that notion to include an environmental portfolio standard (EPS) that allows energy efficiency as an eligible resource. In some cases, utilities can also meet their portfolio requirements by purchasing Renewable Energy Certificates (RECs) from eligible renewable energy projects. Utah has the potential to develop and import significant amounts of cost-effective renewable energy resources, which could result in significant economic development potential in Utah and surrounding states, increased energy security, and improved environmental quality. This issue will be explored in more detail in the Renewable Portfolio workgroup.

ES-2 Create Renewable Energy Development Zones

Assessment: High Priority. Bin B.
The establishment of renewable energy development zones would serve two purposes. First, enhance renewable energy development through the reduction of zoning, siting and other regulatory barriers to renewable resources. This is applicable to transmission line capacity, which is one of the largest hurdles to renewable development. Second, provide economic incentives within the development zone, similar to “enterprise zones”.

ES-3 Green Power Purchases and Marketing

Assessment: Medium Priority. Bin A.
Green Power refers to electricity from environmentally preferred sources, such as renewables. Green Power programs allow consumers to purchase "green tags" along with their electricity ensuring that a quantity of electricity equal to their purchase was produced from renewable resources. In addition, State government could use a green program to purchase a portion of their energy needs from renewable sources.

ES-4 Public Benefit Charge

Assessment: High Priority. Bin B.
A public benefit charge is a fee on utility customers based on their usage of energy which is to be spent on public goods such as energy efficiency. The funds collected are then provided to a third party to provide energy efficiency programming. Furthermore, the charge can be used to create programs such as a "Clean Energy Fund."

ES-5 Tax Credits and Incentives for Renewable Energy

Assessment: High Priority. Bin A.
Tax credits and incentives are popular and effective policy mechanisms to advance certain technologies, especially those that do not currently benefit from other energy subsidies. Tax credits have been supported by Utah's legislature and can prove very effective for advancing renewable energy generation and efficiency with relatively minimal cost.

ES-6 Pricing and Metering Strategies

Assessment: High Priority. Bin B.
The attractiveness of renewable energy projects to developers and to utilities depends, in part, upon the delivered price of the energy to the purchasing entity. The interconnection and/or net metering policies and processes also play an important role in renewable energy project development. Therefore, pricing and metering strategies must be considered as part of a renewable initiative.

ES-7 Research and Development

Assessment: High Priority. Bin B.
Utah should consider providing support and/or funding for targeted R&D for renewable energy and energy storage. Such R &D may prove very helpful in reducing carbon emissions, while spurring economic development opportunities and technological innovation. As compared with other energy resources and technologies, there is currently very little R&D for renewables being undertaken in Utah. (see also CC-4).

ES-B: Encourage Carbon Capture and Sequestration Technologies

Benefit/Cost of Reducing CO_2e:

NM: 25.1 MMt between 2007-2020; 5.3% of 2020 emissions; $29/ton
MT: 11.1 MMt between 2007-2020; 5.6% of 2020 emissions; $30/ton

ES-8 Develop CO_2 Capture and Sequestration Policy

Assessment: High Priority. Bin B.
Some of the key questions to be addressed in the development of a consistent regulatory framework for carbon capture and sequestration (CCS) are: immunity from potentially applicable criminal and civil environmental penalties; property rights, including the passage of title to CO_2 (including to the government) during transportation, injection and storage; government-mandated caps on long term CO_2 liability; the licensing of CO_2 transportation and storage operators, intellectual property rights related to CCS, and monitoring of CO_2 storage facilities. Regulatory barriers may include revisiting the traditional least-cost/least risk regulatory standard or mitigating added risks and financing challenges of CCS projects with assured, timely cost-recovery.

ES-9 Issues for CO_2 Transmission

Assessment: High Priority. Bin B.
Pipelines are required to transport CO_2 to sites that can provide storage. Identify permitting and licensing issues to expedite transmission pipelines. Identify incentives for pipelines, such as direct subsidies, assistance in securing financing and/or off-take agreements, or guaranteed cost recovery.

ES-10 Research and Development

Assessment: High Priority. Bin B.
The State can help secure R&D funding toward sequestration technologies. A goal would be to build an industry around that technology in the state and to set the stage for adoption of the technology for use in the state.

ES-C: Develop and Deploy Advanced Generation Technology

Benefit/Cost of Reducing CO_2e:

N/A

ES-11 Incentives for Advanced Fossil Fuel Technologies that Yield Carbon Reduction Benefits

Assessment: High Priority. Bin B.
Advanced fossil technologies produce lower CO_2 pounds per MWh as a result of more efficient generating technologies (i.e., integrated gasification combined cycle or oxy-combustion technologies) which may also be coupled with carbon capture and sequestration equipment (i.e., chilled ammonia scrubbing). Incentives may be in the form of direct subsidies such as tax incentives to help bridge the cost gap between advanced fossil technologies compared to traditional technologies or assistance in securing financing. Addressing regulatory barriers may include revisiting the traditional utility least-cost/least risk regulatory standard or mitigating added risks and financing challenges of advanced fossil technologies with assured, timely cost-recovery.

ES-12 Landfill Gas/Waste to Energy that Yield Carbon Reduction Benefits

Assessment: Medium Priority. Bin A.
Landfill Gas to Energy (LGE) is process by which gas is collected from Municipal Solid Waste landfills to generate energy, while reducing methane & CO_2 emissions. Currently in Utah there are three operational projects. LGE projects are "low hanging fruit" that create net benefits to the owners and communities and Utah's economy. This option could be structured as either a mandate or an incentive program.

ES-13 Fuel Cell Development

Assessment: Low Priority. Bin B.
The State could initiate R&D or incentives for fuel cell development. The goal would be to build an industry around this technology to benefit Utah's economy.

ES-14 Hydrogen Development

Assessment: Low Priority. Bin C.
The State could initiate R&D or incentives for hydrogen development. The goal would be to build an industry around this technology to benefit Utah's economy.

ES-15 Nuclear Development

Assessment: Low Priority. Bin C.

Although there has been some renewed interest in nuclear because of its low carbon emissions, the questions about waste disposal and safety make it unlikely that nuclear energy development will result in near-term reductions in CO2.

ES-D: Improve Efficiency and Reduce CO_2 at Existing Electricity Generation Plants

Benefit/Cost of Reducing CO_2e:

NM*: 24.3 MMt between 2007-2020; 3.7% of 2020 emissions; $21/ton
MT*: 11.1 MMt between 2007-2020; 1.8% of 2020 emissions; $20/ton
*GPS only

ES-16 Generation or Emissions Performance Standards

Assessment: High Priority. Bin B.
A generation performance standard is a mandate that requires load serving entities (LSEs) to manage their electricity generation portfolio in such a way as to achieve an average annual pounds per megawatt-hour emissions rate limit. A CO2 emissions performance standard is a resource procurement mandate that requires LSEs, when entering into new long-term financial commitments for electricity supply, to only acquire electricity from power plants that can demonstrate a maximum CO2 pounds per megawatt-hour emission rate (for example, 1100 pounds of CO2 per megawatt-hour). The maximum CO2 emissions rate may also be based upon an average CO2 emissions rate over a source's useful life. In both approaches, GHG offsets may be used to achieve compliance.

ES-17 Efficiency Improvements

Assessment: High Priority. Bin A.
Efficiency improvements refer to increasing generation efficiency at power stations through incremental improvements at existing plants (e.g., more efficient boilers and turbines, improved control systems, or combined cycle technology).

ES-18 Fuel Switching

Assessment: Medium Priority. Bin D.
Fuel switching refers to re-powering plants by switching to lower or zero emitting fuels at existing plants or for new capacity additions. This can include co-firing biomass at coal plants or the use of natural gas in place of coal or oil. Policies to encourage re-powering of existing plants could include incentives or regulations.

ES-19 Retrofit Plants w/CO_2 Capture

Assessment: High Priority. Bin C.
Technology is emerging for capturing CO2 on existing power plants including chilled ammonia and other amine scrubbing technologies. These technologies have not been demonstrated at commercial scale, and the economics of such technologies are still being defined. See ES-B for further discussion on CO2 sequestration.

ES-20 Retire Old Plant; Build New Low-Carbon Greenfield Plant

Assessment: High Priority. Bin B.

New low carbon plants could be built to replace older/existing plants that consume high carbon fuels. Such plants could be constructed at sites that have never been used for industrial purposes (Greenfield), or could be constructed at former power plants or other industrial sites (Brownfield). Several regulatory issues need to be addressed, including cost recovery of stranded investment and least cost planning.

ES-E: Promote Combined Heat and Power (CHP)–Distributed Generation (DG)

Benefit/Cost of Reducing CO_2e:

NM: 6.1 MMt between 2007-2020; 0.8% of 2020 emissions; $4/ton
MT: 4.2 MMt between 2007-2020; 1.3% of 2020 emissions; $20/ton

ES-21 Incentives and Barrier Reductions for CHP and DG

Assessment: Medium Priority. Bin B.
Barriers to CHP and clean DG include inadequate information, institutional barriers, high transaction costs because of small projects, high financing costs because of lender unfamiliarity and perceived risk, "split incentives" between building owners and tenants, and utility-related policies like interconnection requirement, high standby rates, and exit fees. The lack of standard offer or long-term contracts, payment at avoided cost levels, and lack of recognition for emissions reduction value provided also creates obstacles.

Policies to remove these barriers include: improved interconnection policies; improved rates and fees policies; streamlined permitting; recognition of the emission reduction value provided by CHP and clean DG; financing packages and bonding programs; power procurement policies; education and outreach.

ES-F: Improve Efficiency of Electric Transmission and Distribution System

Benefit/Cost of Reducing CO_2e:

N/A

ES-22 Remove Transmission/Distribution System Limitations and other Infrastructure Barriers for Renewables and other Clean Distributed Generation

Assessment: High Priority. Bin B.
This is extremely important, especially for the development of clean energy. Improving the regulatory process for siting and permitting of new transmission lines and smart grid development (defined as an enhanced electric transmission or distribution network that provides smart metering, distributed generation management, and demand response, among other benefits) is critical to support the development of renewable energy, in that transmission and effective metering policies/technologies must be in place to move all energy to market.

ES-23 Transmission System Upgrading

Assessment: High Priority. Bin B.
Upgrading the transmission system will improve overall system efficiency, reduce SF_6 emissions, and reduce line losses.

ES-G: Reduce GHG Emissions Associated with Energy Extraction

Benefit/Cost of Reducing CO_2e:

N/A

ES-24 GHG Emissions Reduction from Fuel Combustion in Extraction Operations

Assessment: Low Priority. Bin C.
Fuel combustion in extraction operations can take several forms and should be addressed as separate components of any GHG emissions reduction strategy, including over-the-road transportation of personnel, materials, and equipment; emissions directly associated with exploration and production activities; and emissions related to the transportation of the various mined mineral commodities, often by rail.

Policies to encourage combustion-related GHG emissions reduction could include tax credits for mineral or petroleum producers or establishment of a state recognition program for voluntary efforts such as EPA's Natural Gas Star program.

ES-25 GHG Leakage Reduction Program

Assessment: Low Priority. Bin C. Six of 13 SWG members felt it should be a Bin D.
Estimates of methane loss during production, processing and transportation of hydrocarbons vary greatly. Because methane is a saleable commodity, there is an inherent value that promotes capture and retention of the material. This inherent value also drives regulations (federal and state) that are in place to prevent the waste of and require control of such emissions where there is known to be a risk of significant emissions occurring. Further studies are needed to quantify GHG leakage from extraction sites, transportation facilities, and distribution networks.

ES-H Miscellaneous Energy Supply Options

Benefit/Cost of Reducing CO_2e:

N/A

ES-26 Research and Development

Assessment: High Priority. Bin D.
Targeted R&D may be very helpful in ultimately reducing carbon emissions in such areas as renewables, advanced generation technologies, carbon sequestration, energy storage (relates to CC-4).

ES-27 Remove Regulatory Barriers

Assessment: High Priority. Bin D.
In some instances, specific regulatory challenges have been identified within other policy options. General regulatory barriers include insufficient resources or staffing to addressing emerging issues (i.e., permitting related to GHG emissions, analysis of geological sequestration, or renewables capacity potential). Others include revisiting the traditional least-cost/least risk regulatory standard or mitigating added risks and financing challenges of advanced energy supply technologies with assured, timely cost-recovery.

ES-28 Tax Credits and Incentives

Assessment: High Priority. Bin D.
Tax credits and other incentives are tools that may be applied to encourage the reduction of CO_2 in the energy supply sector.